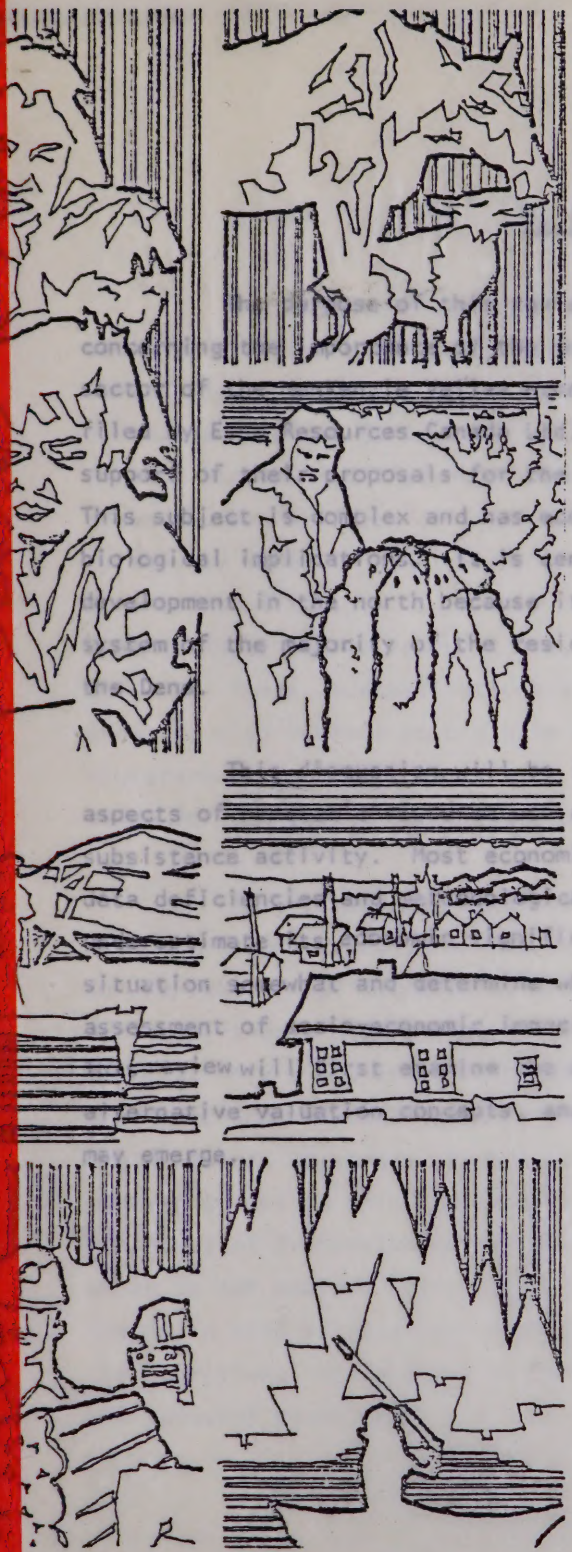

A Review of the Importance of Native Renewable Resources Harvesting and its Relation to the Norman Wells Oil Field and Pipeline Development

For

Esso Resources Canada Ltd.

And

Interprovincial Pipe Lines (N.W.T.) Ltd.

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1. INTRODUCTION

The purpose of this review is to expand upon observations and assessments concerning the importance of the so-called 'traditional' or renewable resources sector of the MacKenzie Valley economy which are made in application documents filed by Esso Resources Canada Ltd. and Interprovincial Pipeline (NW) Ltd. in support of their proposals for the Norman Wells oil development and pipeline. This subject is complex and has economic, social, political, cultural and biological implications. It is central to an understanding of resource development in the north because it is the significant feature of the value system of the majority of the residents of the Central and Upper MacKenzie - the Dene.

This discussion will be limited, to the extent possible, to the economic aspects of renewable resource use and more specifically the evaluation of subsistence activity. Most economic analyses of this sector have suffered from data deficiencies and methodological errors which have combined to consistently underestimate its economic significance. We will attempt to clarify this situation somewhat and determine what effect, if any, this may have on the assessment of socio-economic impacts of the proposed Norman Wells development. This review will first examine the adequacy of the data base, then discuss alternative valuation concepts, and finally, seek any useful conclusions which may emerge.

2. THE DATA BASE

The objective analysis of the economic importance of subsistence activity has been hindered by incomplete and inaccurate data. There are various data available which record renewable resource sector participation and harvest levels (primarily Fur Export Tax Returns, General Hunting Licence Returns and Traders Fur Record Books). The purpose and nature of these sources has been critically examined by several researchers but most notably by Usher in studies for the Inuit Tapirisat of Canada and the Government of the N.W.T.. It is now generally agreed that these sources underestimate native resource use, although by varying amounts depending on species. These underestimations are judged slight in the case of fur bearers, moderate with respect to big game animals and large when it comes to seals and migratory birds. Most small game and marine mammals, fish and some birds taken for domestic use are not recorded on any regular basis at all.

As Mr. Justice Berger pointed out in his Volume Two report: "... the statistical evidence of the use of renewable resources that was presented to the Inquiry was incomplete, inadequate and sometimes confusing." He went on to say that biologists have been aware of these deficiences for some time but that only a few economists have taken recognition of this fact.. Berger concluded that typical economic analyses suffered from one or more of three major sources of error. First, participation is often interpreted as employment and employment as only that activity which generates cash income. Secondly, the estimates of production are often based on government fur and game statistics which do not measure total harvest. Thirdly, valuation methods used to estimate income in kind by relating country food to various substitutes fail to account for nutritional differences or less tangible factors such as taste preferences and cultural practices.

Estimates of the number of participants in the renewable resource economy vary widely. One indication of this level of participation is the number of active trappers. Estimates of this figure placed in evidence before the Berger Inquiry varied from less than 100 to more than 1000. Government data show that 159 trappers in the study area earned more than $600 from furs in 1977-1978.(i) General Hunting Licence holders are perhaps a better indicator. Berger reports that between 1970-1975 there was an average of 2225 such licences issued per year. He compares this to an average native male labour force of 3000 over the same period. He reasons that since a hunter must obtain this licence on his own initiative it is likely that he actually exercises his hunting right. This, of course, does not speak to how much each hunter participates or whether that participation is economically significant. Berger sums up the situation thus:

> "Put simply, no one can provide a clear picture of the participation of the native people in the traditional economy on the basis of the available information."

Neither of the two primary sources of data for volume of production, Fur Export Tax Returns and General Hunting Licence Returns, were designed to quantify total harvest and, not surprisingly, have weaknesses when applied to that task. The Fur Export Tax Returns do not account for pelts used for domestic purposes such as clothing or handicrafts, some furbearers which are taken and used for meat even if the pelt is not used and some furs which become unreported exports when they are sold on a private basis to individuals. General Hunting Licence holders are asked to file an affidavit each year quantifying their take, and statistics are compiled from these returns. Those who do not file a return represent an obvious gap in the data. Estimates can be made of this gap by assuming that those returned are representative of the entire population but the validity of this assumption can be questioned. A major source of error results from the simple fact that hunter's declarations are usually made from memory and it may be very hard to recall accurately the numbers of each species taken. Finally, many hunters fearing further government restrictions and quotas on their hunts may be tempted to understate their harvest.

(i) Regional Socio-Economic Impact Assessment of the Norman Wells Oilfield Development and Pipeline Project, p.65.

Berger is his Volume Two report estimates that the margin of error in recorded fur harvests in the MacKenzie and Western Arctic averages about 1% to 2% for most species but points out that much better documented estimates of error in northern Quebec are between 1.5% and 4.0%.(ii) Berger also produced estimates of error in his game and bird harvests. Total catch expressed as a proportion of officially recorded catch varied from 1.0 for bison and polar bear, to 1.5 for caribou, to 3.0 for ducks and geese and 5.0 for ptarmigan.(iii) Obviously these error margins could be very significant indeed.

An additional data problem presents itself when an analyst tries to convert information with respect to the number of animals harvested into their economic value as food. To do this data as to the useful edible weight of the animals and a valuation per unit of weight are necessary. The question of alternate valuation procedures and related data difficulties will be discussed in the next section but the problem of weight estimates is also complex. There are very few data on average live weights of northern species and different populations of the same species may have different average weights. The weight would also obviously vary by sex and age and one would need to know the averages for each category and the age-sex distribution of the harvest to be accurate. Finally, how much of any given animal is edible? This figure can vary widely due to the season in which is it harvested and cultural preferences of the harvester. Berger reviewed the work of various researchers in compiling appropriate weights by species for the MacKenzie Valley, but his primary source was a 1976 study of the James Bay and Northern Quebec Native Harvesting Research Committee. Berger noted the lack of consistency in these conversion factors and recommended that further research on this problem be undertaken.

In addition to furs and animals taken for human consumption some economic value is derived from use of renewable resources as dog food, raw material for clothing, bedding and handicraft production, and wood used for local construction and heating. There is little or no data at all on which to base an estimate of the magnitude, much less the value, of this production.

(ii) Northern Frontier, Northern Homeland. Vol. 2, p.20

(iii) ibid, p.23

3. VALUATION

Estimating the economic value of native use of renewable resources necessitates interpreting this activity in dollar terms so that non-native southerners can at least attempt to understand and appreciate it. However, as the previous section on the data base makes abundantly clear, this is no easy task. The natural starting point is that portion of the sector which in fact operates on a cash basis and that is the fur trade. The official value of such activity as recorded by the Government of the N.W.T. for the native communities in our study area amounted to $342,674 in 1977/78 and is presented in Table 18 on page 65 of the RMC report. As mentioned above there is some underestimation of total furs taken and although these additional furs would by definition not be sold for cash, Berger gives them the same value as sold furs (which is estimated to be 10% higher than the official average price given by local dealers on the basis that local dealers receive only the poorest furs). These two adjustments lead Berger to the conclusion that the official value of the fur production is 35% too low. If we accept this reasoning the adjusted value of study area fur production in 1977/1978 would be about $460,000.

By far the most important contribution of land based activities to to native economic well-being is food production. As shown in the previous section official statistics suffer from various sources of error when used for this purpose. Given that adjustments can be made to compensate for this error (as Berger did) the question arises as to what value should be placed on this food.

There are two basic valuation techniques which have been used by various researchers to accomplish this task. An economist's first reaction would be to value it at its local market price, if any, or 'opportunity' cost, i.e. what could the hunter sell it for if he did not consume it. This is easily done in the case of a southern farmer's produce, but no real cash market for country food exists in the north. An alternative technique is to develop a 'substitution' cost which seeks to establish the so-called welfare-equivalent value of country food to the

individual by determining how much it would cost the hunter to provide his family with the same amount of food by purchasing it at the store. The question is thus simplified by choosing an appropriate substitute, finding its local price and thereby determining the value.

It seems clear that the choice of an appropriate method depends upon the purpose of the analysis. Palmer (1973) judges, in our opinion correctly, that if one wishes to measure the output of the native economy in comparison to the balance of the regional or national economy a market equivalent or opportunity cost measure should be used. However, if one wishes to determine the welfare of the individual within the traditional sector, the welfare equivalent or substitution cost method is better. With respect to the probelms we are analyzing Usher puts it thus:

> "With respect to more specific issues of the potential impact of development, the choice depends on the perceived nature of the problem. If one can be sure that no conflict exists between the harvesting of modern non-renewable resources and that of traditional renewable resources, due either to environmental or socio-economic factors, so that people will truly and invariably be free to participate in either sector, then market-equivalent measures are appropriate for establishing which activity makes a greater contribution to the total economy. If, on the other hand, there is a conflict, and the two activities prove to be mutually exclusive, then welfare-equivalent measures must be introduced, since the proposed development will obviously affect the welfare of the traditional users of the land." (iv)

Usher goes on to state the latter is more likely to be the case and that many native people fear this will occur.

In reality, non-renewable resource development does not preclude traditional sector activity nor is it neutral. The answer lies somewhere between, and just where depends on the size and nature of the development and mitigating measures implemented by the proponents, governments and the communities involved, but this will be discussed later. The best measure for our purposes then is

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(iv) Usher, Peter J. "Evaluating Country Food in the Northern Native Economy" June, 1976

likely substitution costs tempered by the awareness that the traditional sector operates within a larger economy which views the magnitude of its economic output quite differently. Justice Berger fully accepts Usher's reasoning and uses substitution costs although with no quantitative or qualitative recognition of the sector's role in the larger economy.

Berger's next assumption after developing a total harvest expressed in pounds of edible weight by species and appropriate substitute meats and their prices, was to adjust the numbers further to account for protein differences. Evidence of Drs. Otto Shaefer and Peter Usher is used to indicate that country food has significantly higher protein content than domestic equivalents. Berger also points out that the data on which this is based are sparce and the precise values determined are open to question. The result is that he adjusted the prices of substitute meats by a factor of 1.0 for fish, 1.2 for pork used as a substitute for edible fur bearers, 1.3 for chicken (for birds), 1.6 for beef as a substitute for big game and hare, and 1.8 for beef as a substitute for marine mammals. As can be seen this adjustment substantially increases an already high (due to transportation costs) price per pound. The product of this string of assumptions and calculations represents an estimate of the gross economic value of the product. Its true value, of course, must be a net figure which accounts for the cost of production. Berger again follows Usher's lead in this respect by utilizing his estimate that costs equal about 25 per cent of gross value. This estimate by Usher is based on what Berger describes as "very limited data" and the judgement that no cost should be imputed to the time and labour expended by the hunter in harvesting. These data are from the "mid-nineteen sixties" before the widespread introduction of snowmobiles and the concommitant large increase in hunters' capital and operating costs. The zero valuation for labour was based on a lack of an opportunity cost measurement, i.e. wage employment, but which is certainly available to a much greater degree today. Usher's research is much less assertive about the present validity of this estimate than is Berger. In fact, in another paper Usher seems to hold a different view altogether.

TABLE 1

Disaggregation of Estimates of Average Annual Value of Primary Harvest in the Native Economy, 1970-1975 as Determined by Mr. Justice Thomas Berger

ITEM	VALUE
Human Food [1.]	$1,873,100
Dog Food [2.]	99,668.
Furs [3.]	234,365.
Other [4.]	220,713.
Gross Value	$2,427,846.
Less: Cost of Production @ 25%	606.962.
Net Value	$1,820,884

SOURCE: Northern Frontier Northern Homeland - The Report of the KacKenzie Valley Pipeline Inquiry, Volume two, Mr. Justice Thomas R. Berger, Ottawa, 1977.

NOTES:

1. Tables 2.7 and 1.10 - Big Game [300,000 ($4)] + Furbearers [60,000 ($3)] + Birds [18,000 ($1.95)] + Fish [175,000 ($2)] + Hare [27,000 ($4)] = $1,873,100
2. Table 2.7 - 159,467 lbs. ($0.50) = $79,734 + 25% = $99,668
3. Table 2.2 - $173,604 + 35% = $243,365
4. Taken to equal 10% of all other production values.

The following excerpt from a 1965 report by Usher entitled Economic Basis and Resource Use of the Coppermine - Holman Region, N.W.T. was quoted by Stabler[v]:

> "The implication is, that of the almost fifty percent of regional income derived from hunting and trapping, the same amount or more must be reinverted simply to maintain the same level of income, or in short, that hunting and trapping are not profitable activities, and may even incur deficits."

Few people would dispute that hunting, trapping and fishing is time consuming and requires significant physical and mental effort. Although it may be difficult to estimate, these inputs do have value and are a cost. Difficulty of estimation did not deter Berger or Usher on the other side of the equation.

Let us assume for a moment that all of Berger's assumptions, adjustments and valuations are valid. Since this data is disaggregated by region and his MacKenzie River Region approximates very closely the native communities of our study area, it is possible to determine his estimate of the value of average annual native resource harvest in the study area between 1970 and 1975. As can be seen from Table 1 which details these calculations, this value would be approximately $1,821,000. By further extension of Berger's analysis this would represent about one half of total native income from all sources. These figures could usefully be compared to those in an extensive seven volume impact assessment produced by the Department of Indian Affairs and Northern Development in 1973 and which is referenced by Stabler.[vi] This study utilized well documented income data from the 1970 MacKenzie Manpower Survey and produced figures for income in kind by using substitution values. The writer is uncertain to what extent, if any, official harvest statistics were adjusted to account for error, but the value produced is definitely gross and not net of production costs.

(v) Stabler, Prof. Jack C. A Critique (of Berger's Volume I Report) Prepared for the Research Assistance Group of the Northwest Territories Legislative Council, 1977

(vi) ibid, p.17

The closest approximation of our study area which can be disaggregated from this study is a combination of regions defined as Central and Upper MacKenzie which adds in a few additional communities. The total value of native resources harvests in 1969-1970 amounted to about $431,000 out of a total income from all sources of approximately $1,898.000 or about 22.7 per cent. Due to the nature of the problem and deficiencies in the data base it is not possible to argue with certainty on behalf of either of these sets of estimates. It seems probable that the percentage contribution in individual welfare terms of renewable resource harvesting to total native income in the study area lies somewhere between the two.

What is certain is that southern analysts have often underestimated the economic significance of native renewable resource use and too easily have jumped to the conclusion that it was dead or dying as a means of livelihood. A number of intangible and unquantifiable factors such as taste preferences, traditional food preparation and eating practices, the esteem in which a successful hunter is held in a native community, and the simple satisfaction of being in control of one's means of livelihood, combine to make any dollar estimate of the value of the native renewable resource harvest totally inadequate from the native person's perspective. Its loss or diminishment cannot be compensated for because there are no real substitutes. This only serves to make it harder for southerners and non-natives to understand and appreciate its value.

4. OBSERVATIONS

The purpose of this section is not to judge whether or not native renewable resource harvesting is economically significant. We have established in previous sections that it clearly is to the native people as individuals and as a group. This alone makes it important to the economy of the N.W.T. Instead, this section will examine the relationship of this sector to the proposed Norman Wells oilfield development and pipeline project. Are they compatible or antithetical?

What is under discussion here is inextricably tied to all alternative modes of economic development in the MacKenzie because they all boil down to providing individuals with the economic wherewithal to survive. Berger's central theme was that the native northerner should have a realistic choice of lifestyle-that to be able to choose he must have more control over the decision-making processes which effect him, and settlement of land claims was the only way to achieve this degree of control. It was Berger's judgement that once given this choice many, if not most, natives would opt for renewable resource harvesting rather than wage employment. Berger recognized the need to expand renewable resource development opportunities, heard several witnesses on how this was accomplished in other areas, and a few who presented ideas for the N.W.T. So far the problem is relatively straight forward, the difficulty lies in the question of feasibility of such development.

Berger states the problem very cogently:

> "The basic problem is not the resource base but the realization of a cash income from it. ..... persons participating in the traditional economy spend a total of almost $3.5 million a year to outfit themselves.... These expenses amount to nearly $1600 for each General Hunting Licence holder ..... this estimated $3.5 million is three times the present cash yield from trapping and substantially more than the most optimistic potential yield from this activity .....

> ....This differential does, however, highlight the need for cash from other sources to support the viability of the traditional sector as it now exists, and it demonstrates yet again why so many persons who identify themselves as trappers also work - indeed, may have to work - for wages. In some small communities, transfer payments, such as family allowances and old age pensions, can be important sources of capital for hunting.... Even the most optimistic estimates of the harvest potential of renewable resources do not suggest that every man, woman and child in the territories can harvest enough, not only to eat, but also to pay for all the other things they might want. I have made it quite clear that there is a need for cash that goes far beyond what is at present earned from that sector." (vii)

What this means is clear, outside capital is required to maintain this sector and therefore much more would be required to 'develop' it. During the Berger hearings the chief economic advisor to the Dene, Dr. Melville Watkins admitted under cross examination that some development of the non-renewable sector would be necessary to produce the economic surplus required to support and develop the renewable sector. Almost any economic venture can be made viable with enough support, subsidization of socially desirable economic development projects is not unknown in Canada. One must ask, however, how much progress toward this renewable resource development has been made in the three years since the Berger report? Despite the strength and passion of his arguments the unfortunate answer is: not much. Does this lack of progress have anything to do with the lack of a positive atmosphere for non-renewable projects which could generate the needed economic suplus?

(vii) Northern Frontier Northern Homeland - The Report of the MacKenzie Valley Pipeline Inquiry Volume Two, Mr. Justice Thomas R. Berger, Ottawa, 1977, p. 38

Let us return for a moment to the question of choice between types of economic activity for the individual native northerner by considering the following facts. Dr. Louis-Edmond Hamelin, a noted demographer who is not unfamiliar with the north, in a recent population study states:

> " From 1977 to 1985, by percentage, the increase in the labour force will be greater than the total increase of the population ... we can expect even greater pressure than the present one for finding employment for these workers ..... More indigenous people than one might expect are willing to enter into wage employment, but not at the expense of their northern lifestyle. For most native people it is extremely unlikely that wage employment will soon become an exclusive source of income; for a while, wages will, instead be only a part of what has been called a 'mixed economy' "(viii)

Dr. Jack Stabler's assessment is as follows:

> " We do not know the potential of the renewable resource sector to provide expanding permanent employment. We do know that the number of people in the working-age population in the impact areas will increase by approximately 30 per cent, or 3000 persons, between 1977 and 1982. The facts that are available strongly indicate that an expansion of the renewable resource sector of this magnitude is extremely unlikely". (ix)

Concerning native young peoples' aspirations with respect to economic lifestyle Stabler looks to the work of Dr. Derek Smith whose 1975 study Natives and Outsiders: Pluralism in the MacKenzie River Delta, N.W.T. is virtually the only systematic, quantifiable assessment of northern student aspirations and yet whose conclusions were virtually ignored by Berger. Smith found that when native students were asked to rank 48 occupations according to their own preference, 'hunter-trapper' was ranked 40th. When asked to rank 12 locations according to where they would prefer to work 'on the land' was listed last. Stabler goes on to point out:

(viii) Contribution to the Northwest Territories Population Study 1961-1985, Dr. Louis-Edmond Hamelin, April 1979, Pp 37 and 38

(ix) A Critique Prepared for the Research Assistance Group of the Northwest Territories Legislative Council, Professor Jack C. Stabler, 1977, P. 31

> " The Government of Saskatchewan, beginning in the immediate post World War II period, undertook just such a long-tern strengthening and modernization program of the renewable resource sector in the northern part of that province as Judge Berger envisages. A recent appraisal of this sustained effort concludes 'Government programs of the post war era have been focussed too heavily on attempts to develop the traditional sector. As a result, they have failed to break the dependence of the northern people upon welfare support.' (Socio-Economic Impact Study, Final Report No.25, Churchill River Study, Regina, 1975, P.19) "(x)

Wage employment is not necessarily antithetical to the robust survival of traditional socio-cultural patterns in native communities. Indeed there is growing evidence that rotation employment tends to safeguard many such patterns. Dr. Peter Usher states:

> " The truth of the matter is that the essence of modern hunting and trapping is its combination with part-time or even full time wage employment ..... I believe this situation points to a need for part-time, seasonal employment or full time community based employment both of which are or could be compatible with the basic reliance on the land ... What I am suggesting is that it is not a matter of employment or hunting, it is employment and hunting, so long as they are compatible, because employment can provide the necessary cash inputs to successful hunting and trapping." (xi)

(x) A Critique Prepared for the Research Assistance Group of the Northwest Territories Legislative Council, Professor Jack C.Stabler 1977, P.32

(xi) The Traditional Economy of the Western Arctic, Dr. Peter J. Usher, Evidence Presented on Behalf of COPE - Berger Inquiry, Yellowknife, June 1976, P.13

Foothills Pipelines (North Yukon) Ltd. in their 1979 socio-economic impact assessment of the Dempster lateral agrees by referring to two well documented studies of this phenomena:

> " Studies by Hobart (1974) and Roberts (1977) have shown that participation in wage employment need not interfere with harvest activities under certain conditions. The first condition is a job rotation schedule that allows sufficient time at home between shifts. The second condition is that renewable resources are sufficiently available so they can be readily harvested during work breaks.
>
> Hobart (1974) studied socio-economic effects on Coppermine and Mackenzie Delta residents who were employed by Gulf Oil during 1972-73 and 1973-74 exploration seasons. A survey of Coppermine employees revealed that 50 percent hunted during all or most breaks at home between work shifts and 50 percent hunted once in a while (the rotation schedule was 2 weeks on the job and 1 week at home.)
>
> Roberts (1977) studied the socio-economic effects on Arctic Bay and Pond Inlet residents who were employed by Panarctic Oils on Melville Island in 1973-74. Surveys in the communities revealed that 45 percent of workers hunted during all or most work breaks, 48 percent hunted once in a while, and 7 percent did not hunt during breaks. (The rotation schedule was 20 days on the job and 10 days at home.) Roberts also found that the wage earners spent a significant portion of employment income on hunting and trapping gear and concluded that '... the money from wage employment may be encouraging traditional hunting and trapping activities rather than inhibiting them'. "

5. CONCLUSIONS

It seems abundantly clear from the foregoing that traditional renewable resources harvesting and wage employment in non-renewable resource development are not mutually exclusive, that under certain conditions they are not only compatible but can be complementary. It could even be argued that continued viability of the renewable resource sector is dependent on the economic surplus generated by non-renewable resource development. It certainly seems desirable to be able to have both modes of development (or a combination thereof) available as viable economic pursuits from which the growing number of northern native school leavers can choose.

Where then does the proposed Norman Wells project fit into this controversy? Are the conditions present which would allow the proposal to be compatible with the native renewable resource harvest? Biological studies indicate that due to the overall relatively small scale of the project, the fact that Norman Wells has hosted similar activity for more than 30 years already, that the pipeline will be small inch, fully buried and constructed very quickly, that there will be a minimal amount of disturbance to the renewable resource base. As for attraction of harvesters away from the land, the basic operating philosophy is to staff the project on a rotation basis. This should allow ample time for native employees to continue critical resource harvesting. The proponents are committed to applying this rotation concept to the construction phase as well for the operations and maintenance phase, for northern employees. On an individual level this project should meet the conditions of compatibility. On a collective level the project will generate revenues, which, although modest could be available for reinvestment in renewable resource sector development.